

# PRODUCT SPECIFICATION & EVALUATION

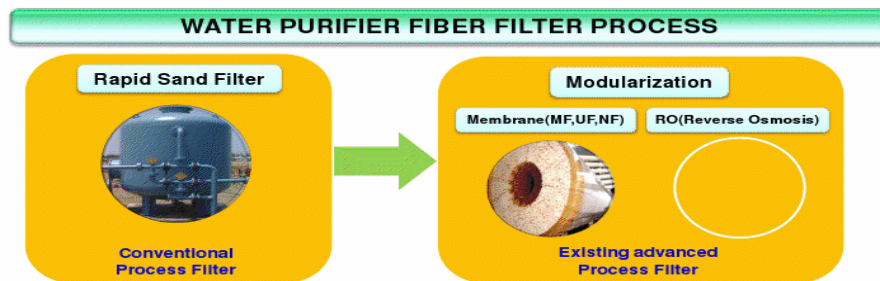
**Product: Advanced Water Purification Systems**

Reviewed By: SOLTECK Engineering Dept

## DESCRIPTION & SPECIFICATIONS

The advanced water purification systems use fiber filter technology called **PCF and GFF**. Fiber filter is an innovative technology with a number of advantages over existing alternatives including automated self-cleaning using feed water and air, low energy consumption, and no requirement for consumables or additives. The robust construction is impervious to a wide range of contaminants and the simple design is easily scalable to increase capacity.

Fig 1. Typical Filter Process



There are two primary technologies available:

Pore Control Fiber Filter(PCF) and Gravity Flow Fiber Filter(GFF)

### 1. Pore Control Fiber Filter(PCF)

Pore Controllable Fiber Filter is made up of Flexible fiber bundles built around a strainer; the fibers are pulled-up in the longitudinal direction to reduce its pore size under pressure.

The technology is a precise and advanced fine fiber filter unit having removal efficiency of over 95% in suspended solids when treating clarified water from a clarifier on a municipal or industrial sewage treatment plant. The average SS in the filtrate water ranges from 1 to 3mg/l.

The filter uses low volumes of backwash water, the filter releases the tension of the fibers then adds air and water to back wash the filter, the combination of air and water moves the fiber bundles in a swift motion cleaning the solids from the fiber bundles.

The PCF unit is compact in size and has low operational requirements compared to pressure type sand filters.

The PCF has an effective backwashing system with Backwash times less than 3minutes, and the volume of backwash water is approximate 2.5% of the final filtrate.

The filter media has a long life span and is simple to remove and exchange when required, the fiber bundles can be made from PP and Nylon materials.

Fig 2. Pore Control Fiber Filter(PCF) - Filtration & Back-Washing

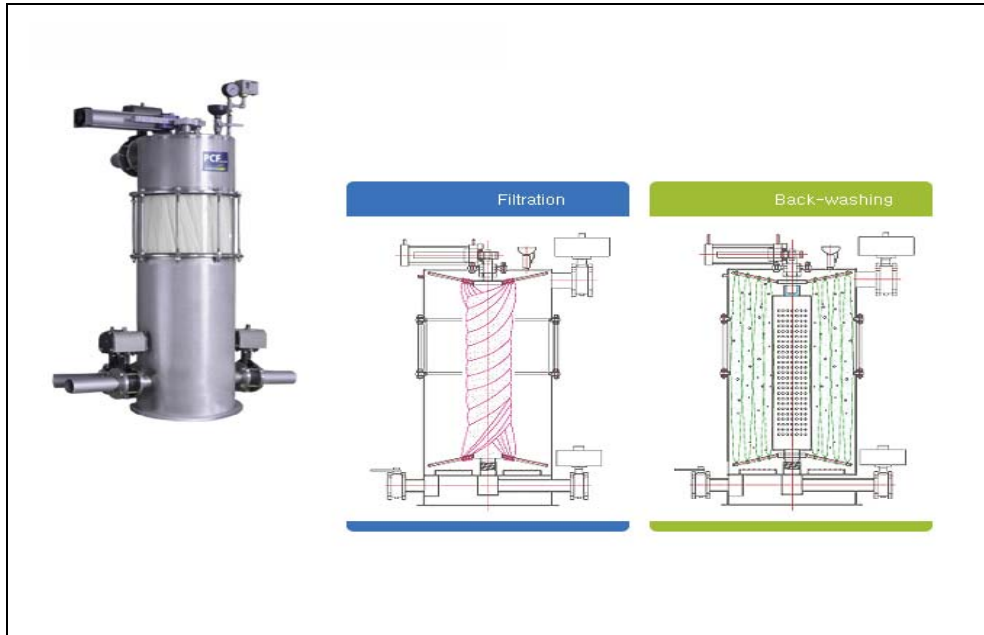


Fig 3. Pore Control Fiber Filter(PCF) - Installation

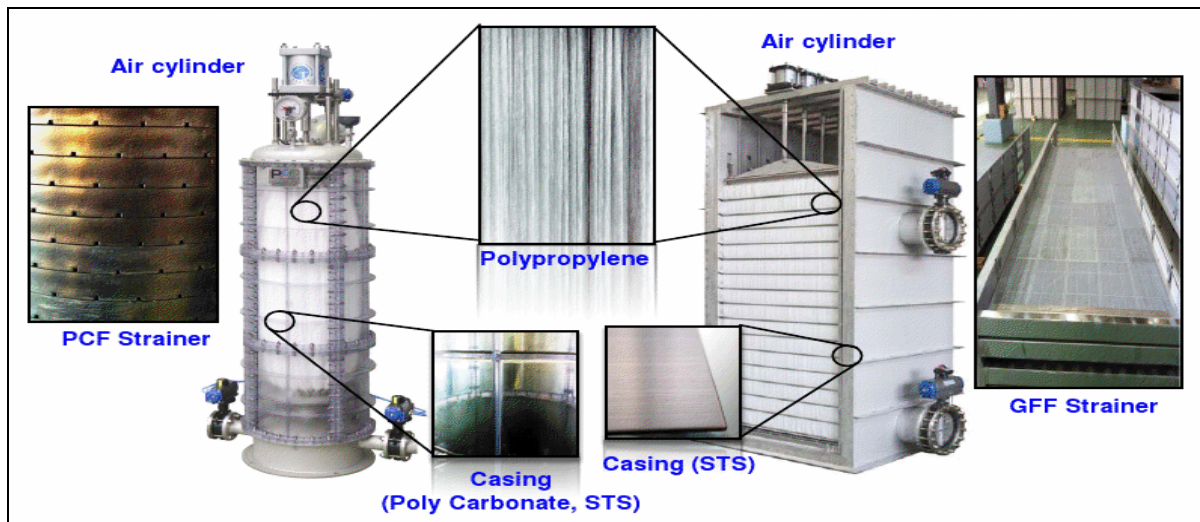


## 2. Gravity Flow Fiber Filter(GFF)

The Gravity Flow Filter or (GFF) is a gravity type fiber filtration system with extended nonwoven fiber filter bundle, which has been fixed on the bottom, and compressed to make 2~3cm of filtering layer thickness on the perforated plate. It filters by gravity to a depth of 30cm water level difference.

Its filtering material is relaxed and backwash with air, when a set water level is reached, it generates violent upward water flow for backwashing using a strong flexing force of the fiber. It is called GFF (gravity flow fiber) filter, also known as a pump-less filter, a backwash pump is not necessary because upward water flow supplies the backwash water when two or more systems have been installed.

Fig 4 – Advanced Water Purification System Overview - PCF and GFF Technologies, side by side



### PROCESS

The filter comprises an in-line' fiber bundle fitted within a cylinder or rectangular chamber. In 'Filtration Mode' the flow moves through the cylinder to a point where a flexible compression. Is activated on the fibers to constrict the flow. Particles are retained in gaps between the compressed fibers; the degree of compression is varied by altering pressure on the fiber bundles. The progressive narrowing of pore spaces between fibers provides the significant advantages of low pressure loss and natural grading through size exclusion. The process can be made more efficient by using pressure and fiber size to allows precise control of particle size removal efficiency.

One of the disadvantages of membranes and other self-cleaning filters is that once they block up they are difficult to clean. In contrast, the Solteck process has a fast, efficient and fully automated 'Flushing Mode.' During flushing, pressure is removed to open up the fibers and air and water is activated and the solids are transferred to waste. The flushing sequence takes 0-3 minutes and uses a small quantity of feed water. Media filters and Membranes filters often require use of filtered water in significantly higher volumes. Immediately after flushing the pressure is re-established, and the filter is back in service.

## STRENGTHS

### No need of filtration pump:

Filter material is compressed in 2~3cm thickness on the perforated plate for the gravity filtration by 30cm water level difference.

### No need of backwash pump:

Filtration tank water is supplied automatically by overflow as of the water level rise when spraying the backwash with air (when multiple systems are installed)

### Minimized filtration device:

Rectangular type filter plate for wider filtering area same square m2 as a cylindrical type filter unit.

### High efficiency filtered water quality:

Deep filtration effect by thick nonwoven mobile filter layer compared to fixed woven filter layer.

### High efficiency backwash function:

Flexible backwash is available by nonwoven mobile filter layer to prevent salt attachment and buildup of bacteria.

### Maintenance during operation:

Design to prevent inflow mixing of raw water by activation of check valve when installing/detaching the unit filter (optional)

## RECOMMENDED DEPLOYMENT SCENARIOS:

The product is designed to meet requirements for the following deployment scenarios and industry solutions:

- Improvement of discharging water quality from municipal and industrial clarifiers.
- Pretreatment filtration prior to membrane separation
- Filtration of all types of algae from different water bodies
- Filtration of swimming pool and aquarium waters
- Filtration of cooling tower water.
- Filtration of Mining waters.
- Filtration for Municipal Treatment Plants
- Filtration for Water treatment plants
- Filtration for Food plants
- Filtration for Petrochemical plants
- Filtration for Paper plants
- Filtration of river bore well and lake water

## PERFORMANCE RESULTS IN LIVE OPERATION:

- Suspended Solids – 90 to 95% reduction
- COD 25 to 35% reduction
- Total Phosphates 85-90% reduction

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